

M0000582



## User's Guide

SANYO DENKI CO., LTD

## **Introduction**

Thank you for purchasing the “PY Remote Operator for Windows”.

The “PY Remote Operator for Windows User's Guide” describes how to set up, connect, and use the PY Remote Operator for Windows. (for “PY” series servo drivers)

The “PY Remote Operator for Windows” has been designed as a tool for helping users of “PY” series servo systems to do operational checks safely and to do adjustments and setup easily.

To prepare for achieving full use of the “PY Remote Operator for Windows” , thoroughly read this user's guide as well as the accompanying instruction manual of your “PY” servo driver.

Keep the guide in a convenient place so it is available for your reference whenever necessary.

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## Conventions Used in This Manual

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The following conventions are used to describe mouse and key operations.

### Mouse operation

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- Click: Indicates a quick press and release of the left mouse button.
- Double-click: Indicates two quick clicks of the left mouse button.

The product can be operated only with click and double-click operations.

### Key operation

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[Enter]	: Key names are enclosed in brackets ([ ]).
[Shift] + [ F 1 ]	: A plus sign (+) indicates a two-key combination. This example indicates to press the [F1] key while pressing the [Shift] key.
[Return]	: Commands and menu buttons are also enclosed in brackets ([ ]).
Arrow key	: Indicates[ ],[ ],[ ],or[ ] key.

### Key notation

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This guide uses standard generic key notation to explain key operations.

Keyboard notation may be different depending on manufacture or machine type.

For details, refer to the section explaining "keys list" in your Windows manual or the manual provided with your computer.

## **Chapter 1 Before Starting**

## 1-1 Overview

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PY Remote Operator for Windows allows you to change servo driver parameters, perform batch saves and loads, monitor operational conditions, display waveforms, and run miscellaneous test modes by means of serial communication between your computer and servo driver.

### 1-2 Package contents

Your package contains the following items:

- |  |     |
|--|-----|
| - This User's Guide                        | one |
| - Cable for connecting driver and computer | one |
| - 3.5" floppy disk                         | one |

### 1-3 Hardware requirements

The following hardware is required as well as a servo driver and servo motor. Configure the system according to the instructions provided with the devices.

Computer	: Personal computer running Windows 95 <sup>®</sup> 3.5" floppy disk drive Hard drive: At least 4 MB free space At least one free serial port (depending on the connector type of the serial port, third-party converting connector may be necessary).
Display	: Supporting at least 800 x 600-pixel resolution and 256 colors.

### 1-4 Setup

Set up the software by following this procedure:

1. Stop all applications that are running.
2. Insert the installation floppy disk into the floppy disk drive, and find and double-click setup.exe on the floppy disk, or press the Start button and use "Run..." to execute setup.exe.

When the installation process starts, follow the instructions appearing on the screen.

<p><b>NOTE:</b> Copying the shortcut from the PY Remote Operator for windows window to PYIF.exe onto the desktop makes starting the PY Remote Operator for Windows more convenient.</p>
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This completes installation.

3. Connect the OP connector on the PY servo driver to the serial terminal (COM) on the computer with the provided cable.

This completes the setup procedure. To start the software, click [Start] from the Start menu, [Programs], [PY Remote Operator], and [PYIF].

## **Chapter 2 Basic Operations**



## 2-1 Radio buttons

Use these buttons to select one of the preset value groups. A black circle indicates the selected value.

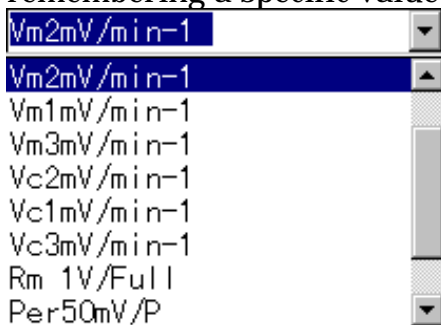
To select a value using the mouse, place the mouse cursor on the circle and click. To select a value using the keyboard, use arrow keys to select the value and press the **[Enter]** key.






The example in the left figure shows "ON LINE" selected.

## 2-2 Combo boxes

Use a combo box to select a value from a range or from a number of data, including masters. Selecting a value from a list is far easier than remembering a specific value and typing it in.



To display the selection box, click the  button.

If an entire list is not visible, use the  or  key to scroll through the list until desired value appears.

The scroll bar indicates the current position in the Combo box.

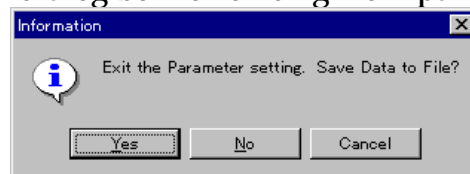
## 2-3 Confirmation dialog box

The system displays a confirmation dialog box to confirm your decision; for example, to make sure that you really want to save data.

To proceed to the next step, check the message and select the appropriate response.

The following figure shows an example of the confirmation dialog box that appears after parameter settings have been modified and the **[Main Menu]** button has been pressed. Selecting **[Yes]** opens the existing screen, selecting **[No]** returns to the Main menu without saving the changes, and selecting **[Cancel]** closes the displayed confirmation dialog box and returns to the [Set parameters] dialog box.

Conformation dialog box for exiting from parameter setting



## 2-4 Notes on operation

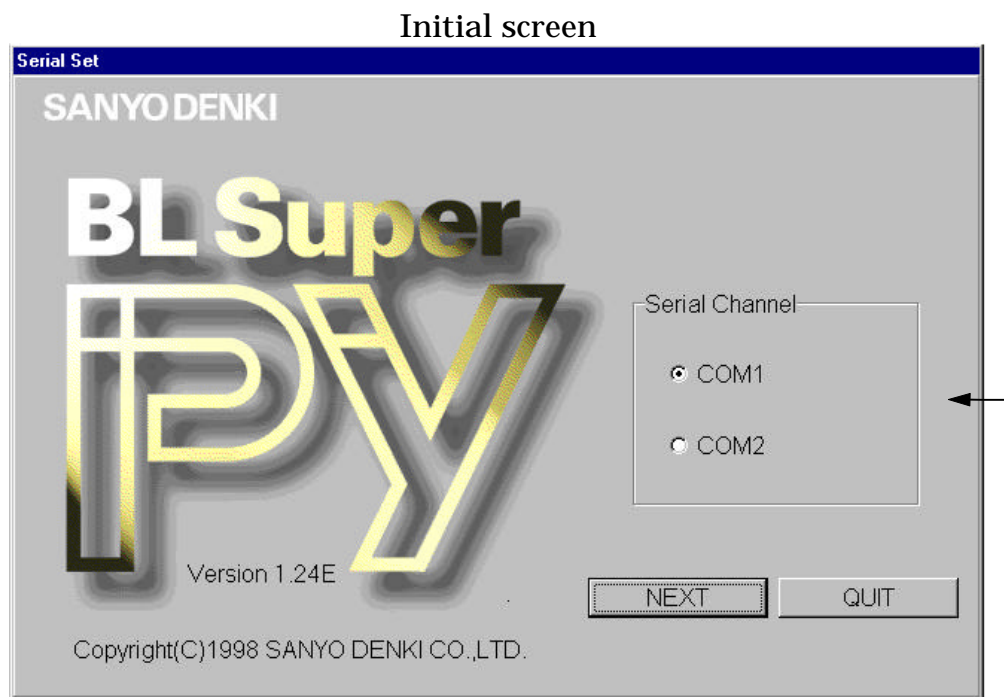
- Numeric values entered into the [Edit/Set parameters] dialog box must be half-size characters. Full-size characters can be used for filenames and comment entries.
- This software does not support removal of a parameter file.

## **Chapter 3 Initial Screen and Main Menu**

### 3-1 Initial screen

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Use the PY Remote Operator for Windows initial screen to select the RS232C port on the computer that connects to the servo driver.



#### 3-1-1 Setting up RS232C port

Click either COM1 or COM2 in section . A black dot indicates the selected radio button. Then click the **[NEXT]** button to set up the RS232C port. The Main menu reappears.

#### Description of items

<b>[RS232C port]</b>	: This section is for selecting the RS232C port on the computer that connects to the servo driver.
<b>[NEXT]</b>	: Accesses the Main menu.
<b>[QUIT]</b>	: Exits from the PY Remote Operator for Windows.

## 3-2 Main Menu screen

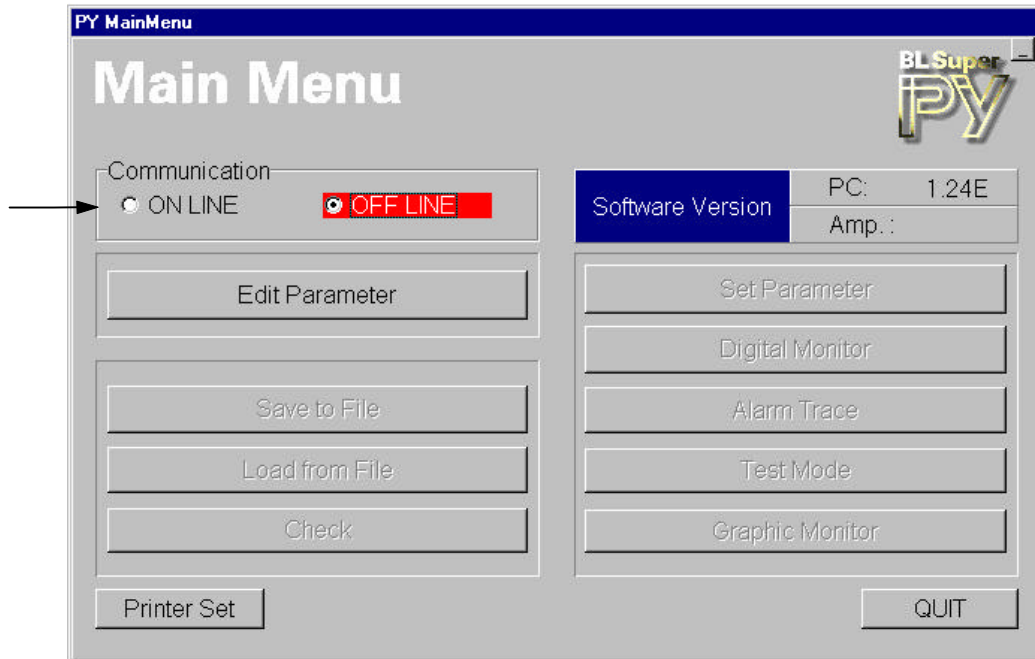
### 3-2-1 Main Menu screen

Change from the initial screen to the Main menu.

From the Main menu, you can connect to the servo driver, set up or edit the parameters or display the alarm history, test mode, or operation waveform.

As the system moves from the initial screen to the Main menu, the connection to the servo amplifier appears as OFF LINE status. In the OFF LINE status, only editing parameters (see Chapter 4, “Editing Parameters”) is available.

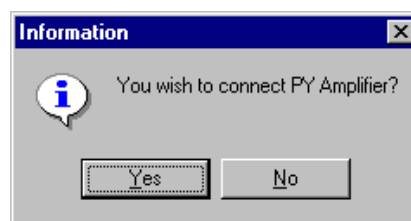
Main Menu screen under OFF LINE status



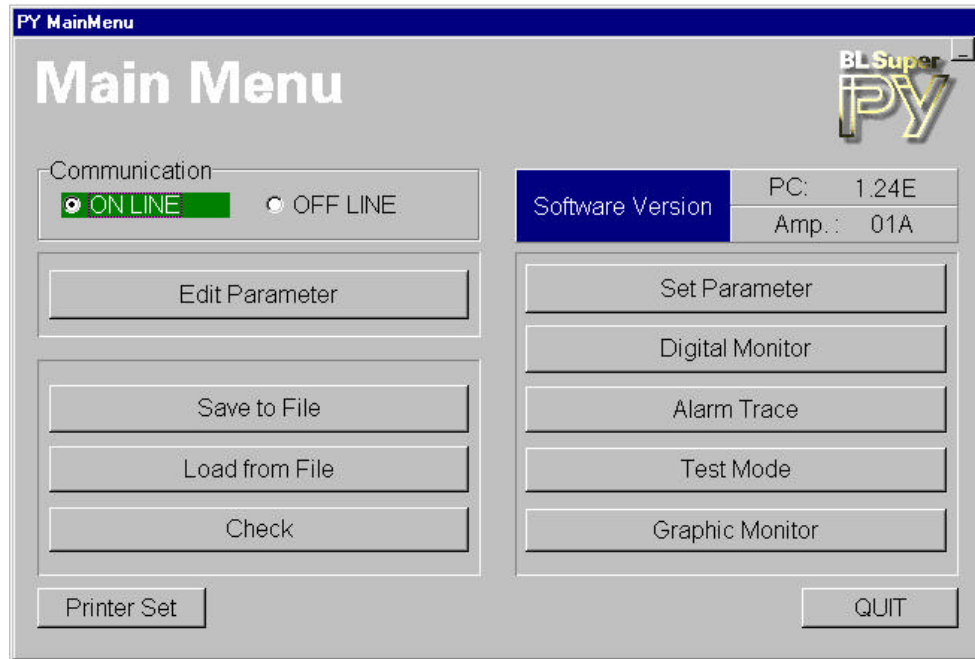
### 3-2-2 Connecting servo amplifier to computer

1. Use the provided cable to connect the serial terminal (COM) to the OP connector of the PY servo driver.
2. Turn on the servo driver.
3. Click [ON LINE] in section . The connection to the servo driver is confirmed. Click the **[Yes]** button in the message dialog box to establish the connection. When the connection is established, the process buttons (parameter settings, monitors display, etc.) are enabled.

Confirmation Dialog Box



## Main Menu screen under ONLINE status



### Description of items

**[Software version]** : Displays the versions of this software and servo driver CPU.

Pressing any of the following buttons starts its associated action.

**[Driver <-> PC]** : Connects/Disconnects the computer to/from the servo driver.

**[Edit parameters]** : Edits the parameters on the disk.

**[Save onto disk]** : Saves the set parameters of the servo driver onto the disk.

**[Load from disk]** : Loads the parameters from the disk to the servo driver.

**[Match parameter]** : Matches the parameters on the servo driver with those on the disk.

**[Set parameters]** : Sets the parameters of the servo driver.

**[Display monitored values]**: Displays the monitored values.

**[Display alarm history]**: Displays alarm history.

**[Test mode]** : Runs the following test mode operations:

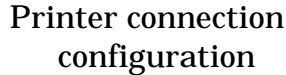
- Jog operation
- Servo tuning
- Directed offset adjustment
- Absolute encoder clear

**[Display operation waveform]**: Displays the operation waveform.

**[Printer configuration]**: Change the printer configuration.

**[QUIT]** : Exits from the PY Remote Operator for Windows.

The [Printer configuration] dialog box is for selecting the destination printer and the form size before printing a parameter editing list or alarm history list.



In section **Printer**, the name of the printer driver configured for printing from the PY Remote Operator for Windows appears in the [Name] field and the connection configuration appears under the field.

- **Size:** For selecting the form size for printing. (Note that the form selection may vary depending on the printer type.)
- **Feeding:** For selecting printer form feed method.  
Example: Cut-sheet guide: Manually feeds sheets one by one.  
Automatic-sheet feeder: Sets more than one sheet of paper together.  
Cut-sheet feeder: Same as the automatic-sheet feeder.

Specifies the direction of printing, either landscape or portrait, without regard to the direction of paper insertion.



### Direction of feeding

## (2) Landscape

### Direction of feeding

**NOTE: Select Printer configuration**

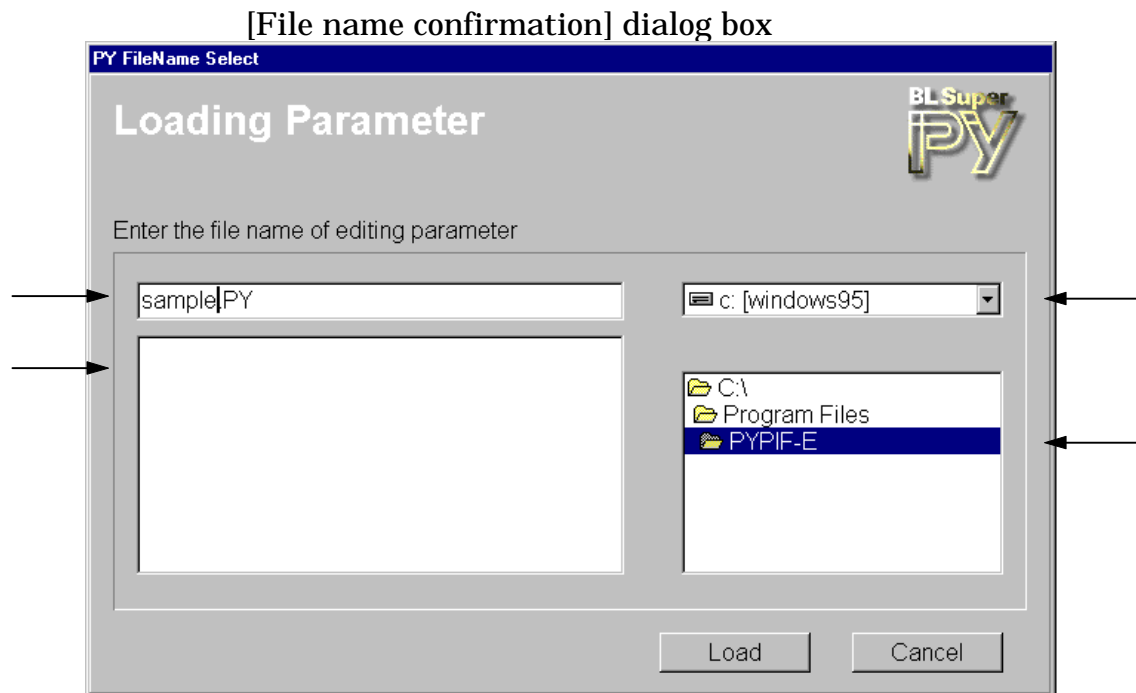
SIZE: A4

Printing orientation: Portrait

Please don't select other configuration.

### 3-4 Loading files

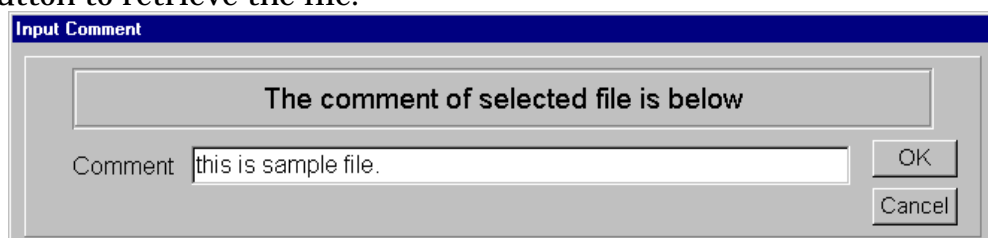
1. The following [Load parameters from disk (File name confirmation)] dialog box appears when data is loaded from a file.



The dialog box has the following four panels:

Drive:	...	The drive where parameter folders reside.
Folder:	...	The folder containing parameter files.
Parameter file name:	...	The parameter file to be edited.
File list:	...	The list of files in the folder in .

2. Make sure the files are listed in Parameter file name (or type in the desired file name directly) and click the **[Load]** button.
3. The comment on the selected parameter appears. Read the comment and click the **[OK]** button to retrieve the file.



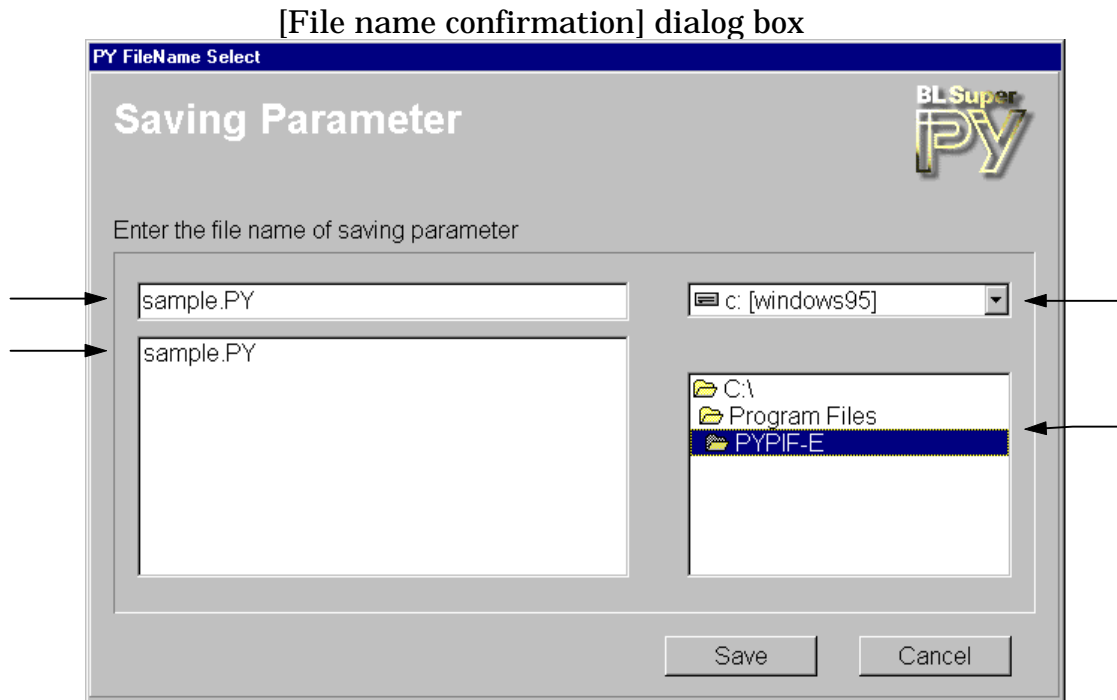
To cancel the loading, click the [Cancel] button.

Description of items (excluding , , and )

**[Cancel]:** Returns to the Main menu.

### 3-5 Saving files

1. The following [Save parameters onto disk (File name confirmation)] dialog box appears when data is saved to a file.



The dialog box has the following four panels:

- |                      |  |
|----------------------|--|
| Drive:               | The drive where parameter folders reside.      |
| Folder:              | The folder containing parameter files.         |
| Parameter file name: | The parameter file to be edited.               |
| File list:           | The list of files specified in the folder in . |

Select the drive of the target folder in Drive and the target folder in Folder, type in a new file name, and click the **[Save]** button.

2. The [Comment Entry] dialog box appears. Type in a comment and click the **[OK]** button. You may omit the comment.

The new file has been saved.

**NOTE: If you save the file with an existing file name, the existing file is overwritten and its contents are erased.**





## **Chapter 4   Editing Parameters**

## 4 Editing Parameters

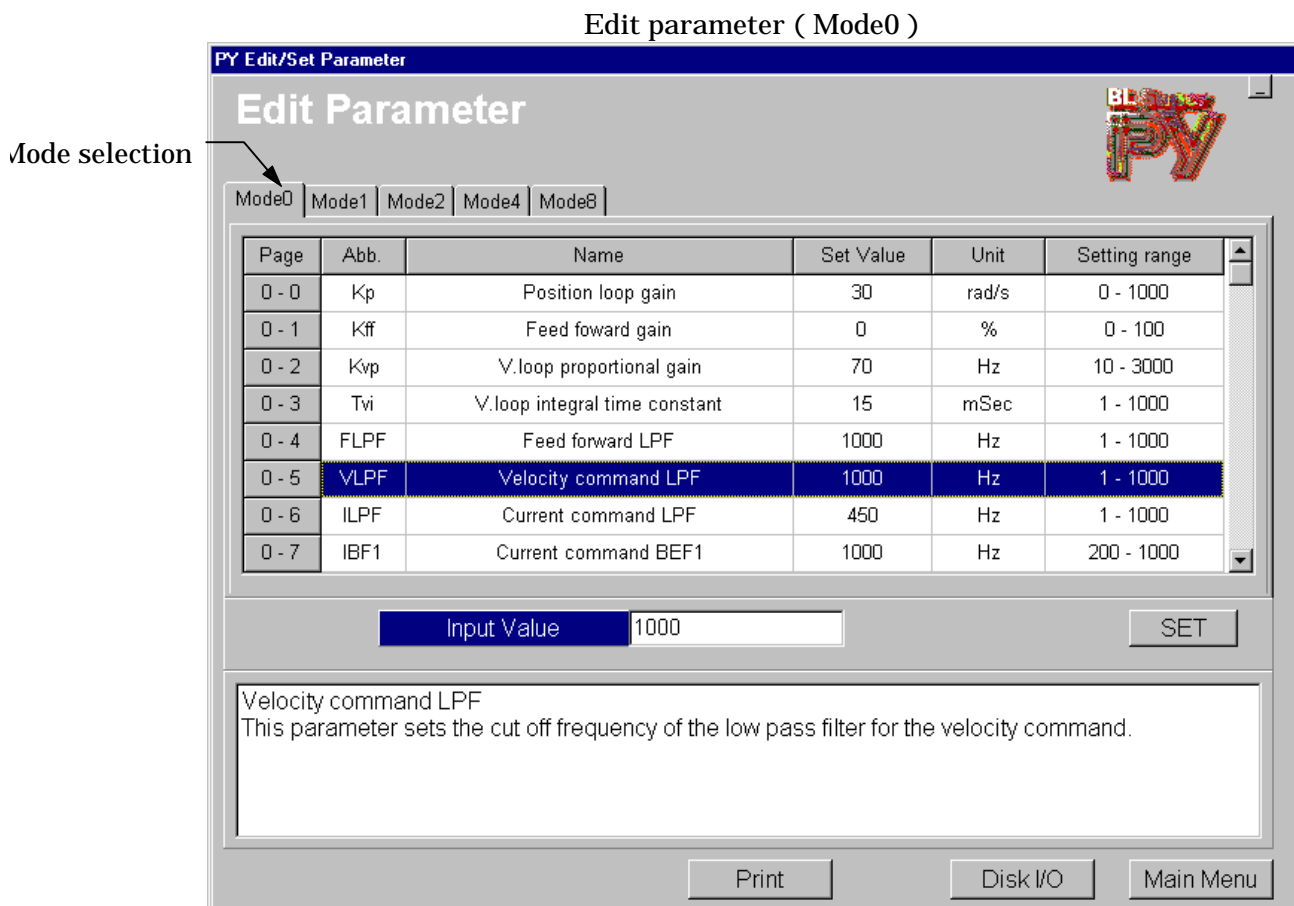
The [ Edit parameters ] dialog box is used for accessing a parameter file stored on disk in order to modify it. This only changes the parameters on a file instead of transmitting parameters to the servo driver directly.

### 4-1 Accessing parameter file

Before you can edit parameters, you must access the existing parameter file. For the instructions on accessing, see Section 3-4 “Loading files,” and load the parameter file (with an extension .py).

### 4-2 Parameter mode

The [ Edit parameters ] dialog box has five tabs for selecting modes: modes 0, 1, 2, 4, and 8. Modes 0, 1, 2 and 8 can be changed with key entries. Mode 4 represents the mode of the parameters that can be modified by making selection from the existing items list. A description of each parameter appears in the lower panel.



### 4-3 Editing parameters

1. Click the mode where the parameter to edit is stored.
2. Click the target parameter in the mode.
3. The parameter value on the clicked line appears in the [Parameter Entry] field. Specify any value within the available range.
4. After entering the parameter and checking the value or item, pressing the [Enter]

key or clicking the **[SET]** button sets the entered value as the parameter value. If you do not press the [Enter] key or click the **[SET]** button, the entered value is discarded.

5. To save the changed parameters, click the [Disk I/O] button and select **[Save onto disk]**. Also, on the way to returning to the Main menu by clicking the **[Main Menu]** button you can save the parameters.

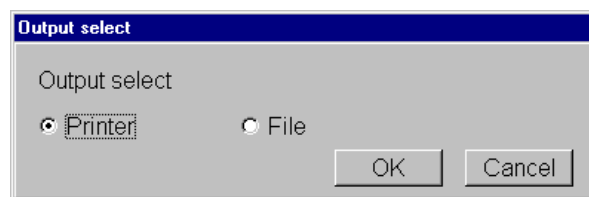
The buttons on the [Edit] dialog box and their functions are as follows:

- [SET]:** Sets up the changed parameter. This is the same as pressing the [Enter] key.
- [Disk I/O]:** Accesses the [Save parameters] or [Load parameters] dialog box.
- [Main Menu]:** Exits from the [Edit] dialog box and displays the [Save confirmation] dialog box.

#### 4-4 Printing parameters

You can print the parameters from the [Edit parameters] dialog box,. The following is the printing procedure:

1. Click the **[Print]** button.
2. The following dialog box appears. Select a printer or file as the output destination and click **[OK]**.

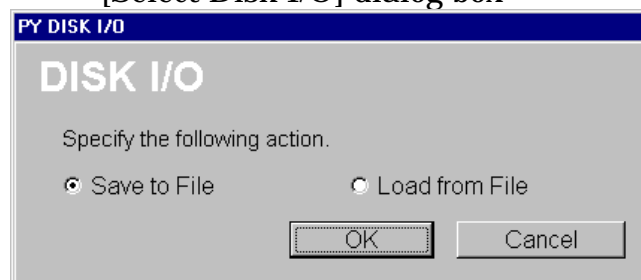


If you selected a file for the output destination, a dialog box prompting the file name appears.

#### 4-5 Disk I/O

If you click the **[Disk I/O]** button, you can save or load a parameter file during editing, and you can edit the parameters repetitively.

[Select Disk I/O] dialog box



- Select [Save onto disk] and click **[OK]** button and the [Save parameters to disk] dialog box appears. You can save the currently editing parameters to a file.
- Select [Load from disk] and click **[OK]** and [Load parameters from disk] dialog box appears. You can edit another parameter file further.

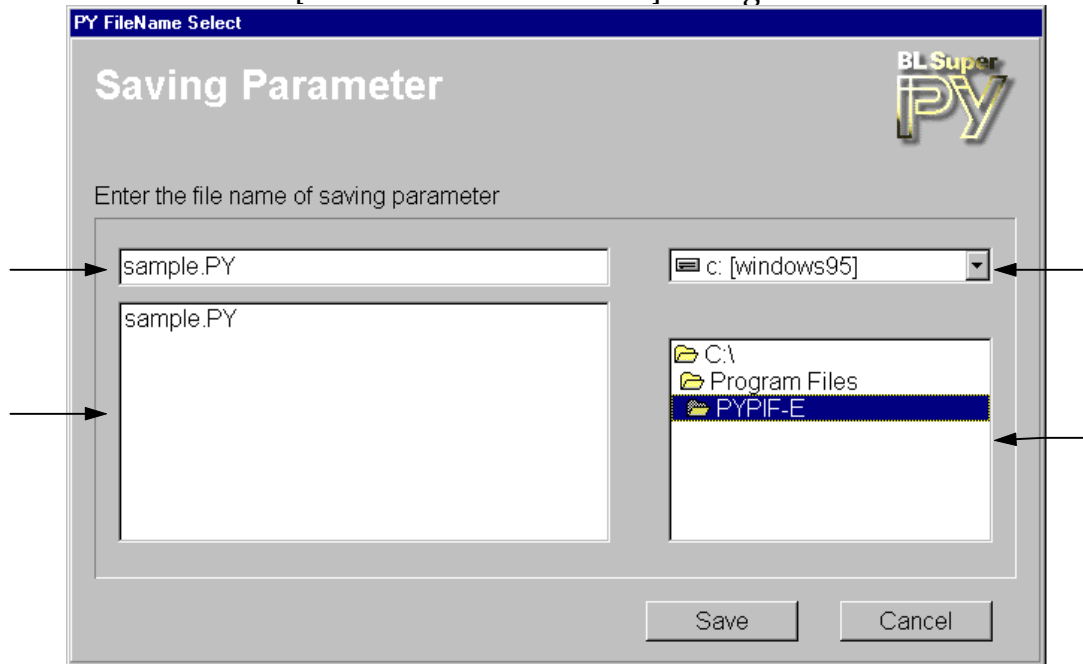
**NOTE: If you save the file with an existing file name, the existing file is overwritten and its contents are erased.**

## **Chapter 5   Save Onto Disk**

## 5 Save Onto Disk

**[Save onto disk]** saves all the current parameter settings on the servo driver and stores them together in a parameter file. At this time, the parameters are not displayed on the dialog box but directly saved into the disk. If you want the parameter settings at this time, use the [Edit parameters] dialog box and check them.

[File name confirmation] dialog box



### 5-1 Saving onto disk

1. Click the **[Save onto disk]** button from the Main menu.
2. Select the drive of the target folder in Drive and the target folder in Folder.
3. Type in a new file name and click the **[Save]** button. The new parameter file is stored. If you use an existing file name, the file is overwritten.

**NOTE: If you save the file with an existing parameter file name, the existing file is overwritten and the parameter settings in the file are erased.**

**Description of items** (excluding , , and )

**[Save]:** Saves the parameters into a file with the specifications in , , and .

After clicking the **[Save]** button, the [Comment Entry] dialog box appears for the saved file.

Enter a comment and click the **[OK]** button to save the parameters into the file. (The comment may be omitted.)

**[Cancel]:** Returns to the Main menu without saving the parameters.

## **Chapter 6 Loading From Disk**

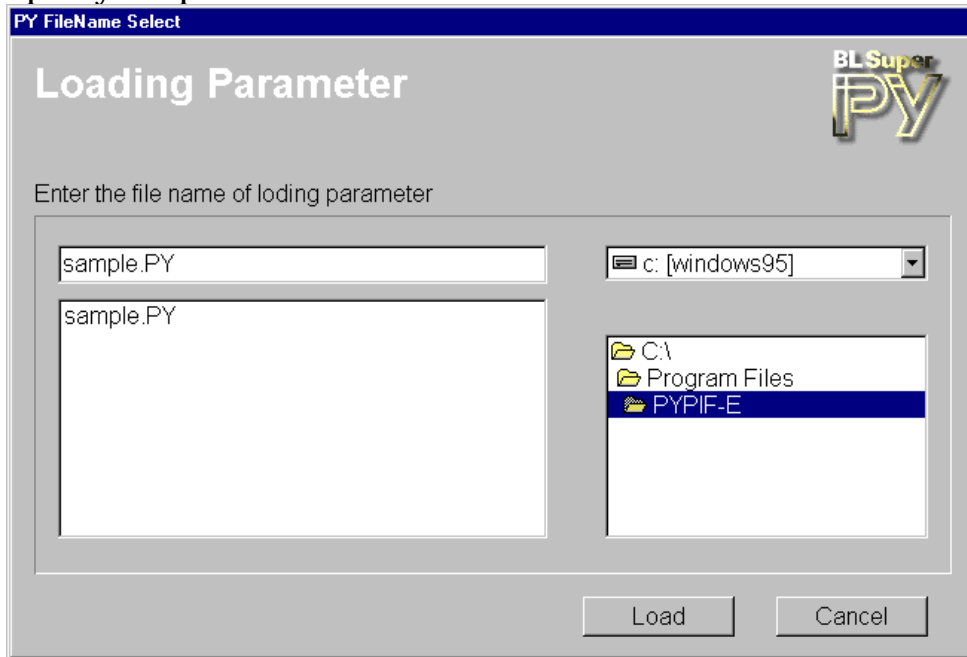


## 6 Loading From Disk

**[Load from disk]** loads all the parameters from a parameter file into the servo driver for configuration.

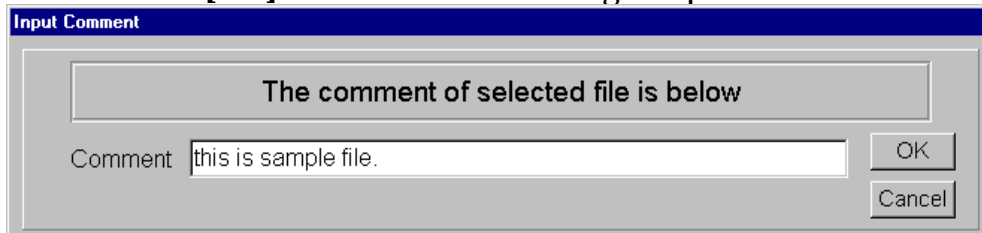
### 6-1 Loading parameters into the servo amplifier

1. Click [Load from disk] from the Main menu.
2. Specify the parameter file to load into the servo driver.



Make sure the file name appears in Parameter file name (or directly type in the file name) and click the **[Load]** button.

3. When the comment on the selected parameter file appears, check the comment and click the **[OK]** button to start loading the parameters into the servo driver.



4. To make the loaded parameters effective, turn off the servo amplifier and again turn it on. At the same time, also put the PY Remote Operator for Windows off\_line from the Main menu (see page 7).

#### NOTES:

- This dialog box does not show the set values in the selected parameter file. To check the value, use the [Edit parameters] dialog box.
- After these steps, the current driver parameters are overwritten.
- If a power failure or communication failure occurs when loading, restart it.

## **Chapter 7 Parameter Matching**

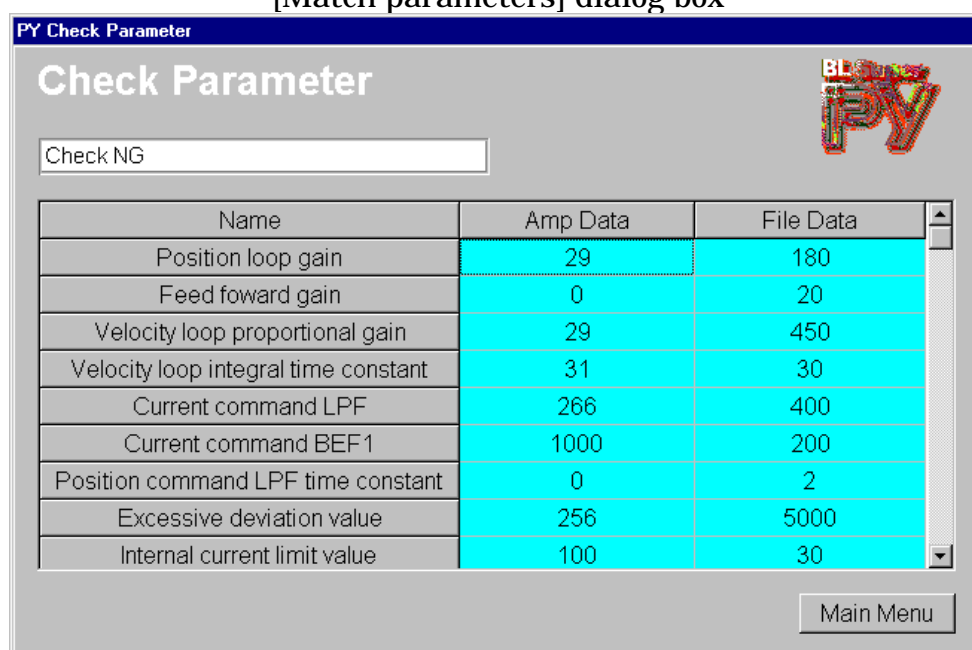
## 7 Parameter Matching

The **[Match parameters]** dialog box matches the parameters in the servo driver with the parameters in the disk and creates a list of mismatches if applicable. This feature does not save the result of the task.

### 7-1 Matching parameters

1. Click **[Match parameter]** from the Main menu.
2. Specify the matching parameter file in the [Select file] dialog box.  
For instructions on how to specify the file, refer to Section 3-4, "Loading files."
3. Click the **[Load]** button. The comment on the selected file appears. Check the comment and click the **[OK]** button to start matching parameters.
4. After matching parameters, if any difference is found between the driver data and file data, the following list appears.

[Match parameters] dialog box



Name	Amp Data	File Data
Position loop gain	29	180
Feed forward gain	0	20
Velocity loop proportional gain	29	450
Velocity loop integral time constant	31	30
Current command LPF	266	400
Current command BEF1	1000	200
Position command LPF time constant	0	2
Excessive deviation value	256	5000
Internal current limit value	100	30

Description of other items

**[Main Menu]:** Returns to the Main menu.

**NOTE:** If you have any parameter whose name is represented as "system area," consult our technical service.

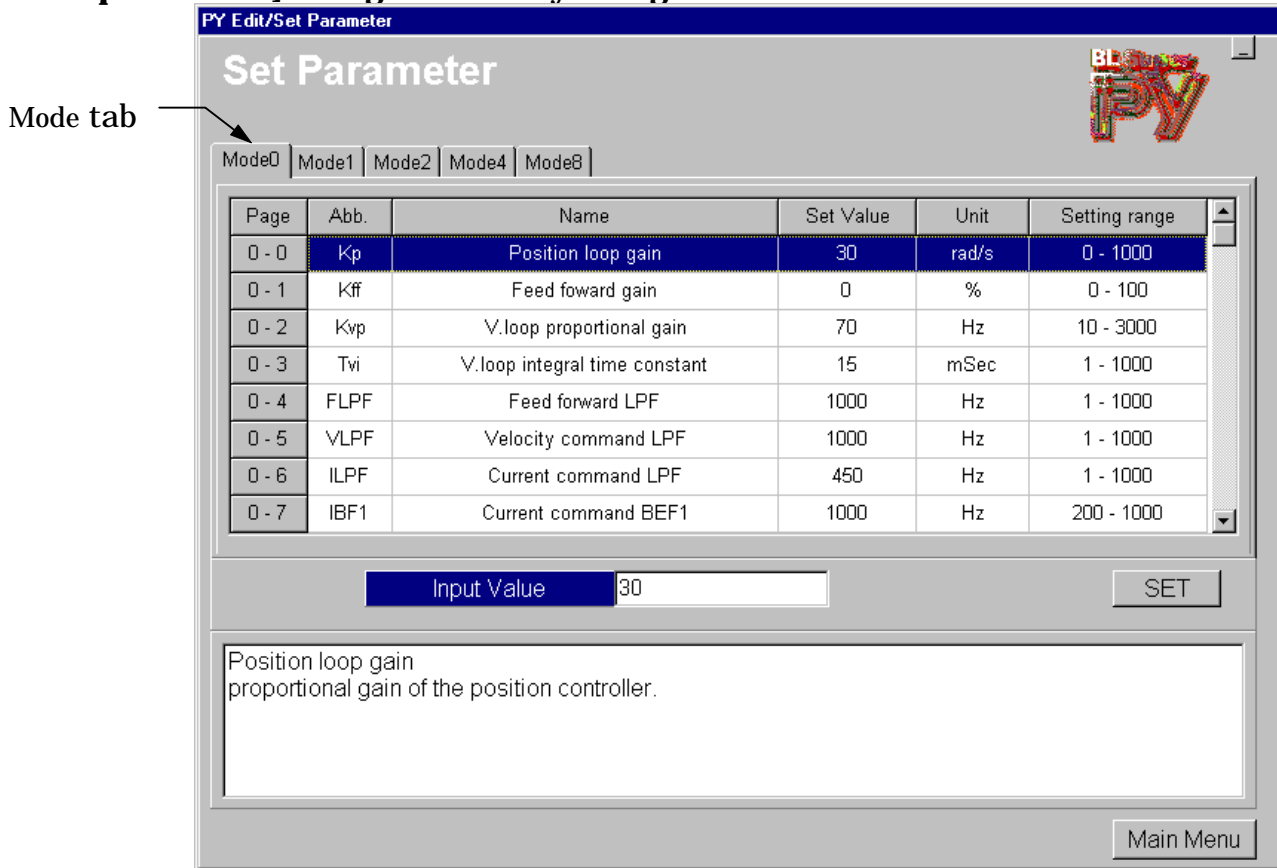
## **Chapter 8   Setting Parameters**

## 8-1 Set parameters

The [Set parameters] dialog box displays the parameters in the connected servo driver. Whenever you change any of them, the parameters in the servo driver are updated.

The [Set parameters] dialog box has five mode tabs: modes 0, 1, 2, 4 and 8. Modes 0, 1, 2 and 8 are parameters that can be modified by typing from the keyboard. Mode 4 is a parameter that can be selected from the predefined item lists. The comments in the bottom panel describe the selected line.

**The [Edit parameters] dialog box edits the set value in a file, and the [Set parameters] dialog box directly configures the set value in the servo driver.**



## 8-2 Parameter setting

1. Click the **[Set parameters]** button in the Main menu to read the parameters in the connected servo driver and display the set values in the **[Set parameters]** dialog box.
2. Select a mode, click the item to change, type a value in the [Parameter entry] field, or select from the Combo box. Then, press the [Enter] key or click the **[SET]** button to send the modified value to the servo driver.
3. Click the **[Main Menu]** button to return to Main menu. At this time you can select whether to save the change into a file.

**NOTE: When changing a parameter, do not deviate from the specified range.**

### Description of items

**[SET]:** Send the values selected in the Parameter Entry field to the Driver.

**[Main Menu]:** Closes the setting dialog box and opens the [Save confirmation] dialog box.

## **Chapter 9    Monitor Display**

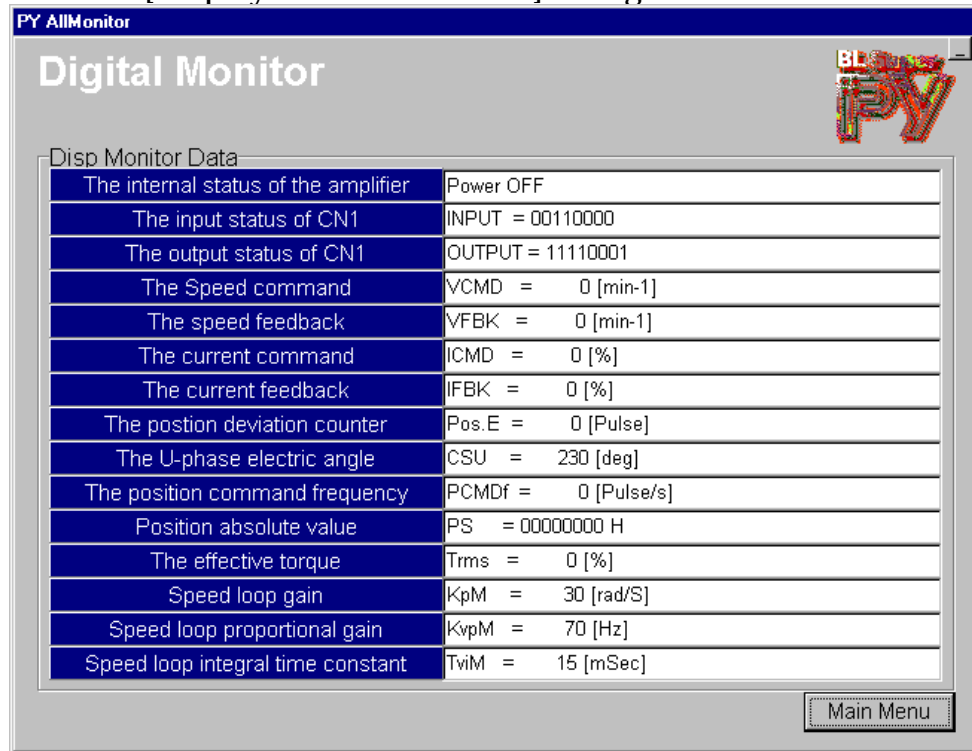
## 9 Monitor Display

**[Display monitored values]** lists the monitored conditions of the connected driver.

The following items are monitored:

- Status
- Directed speed
- Current feedback
- Frequency of directed position
- Position loop gain
- Speed loop integral time-constant
- Status of CN1 input pin
- Speed feedback
- Electric angle of phase U
- Speed loop proportional gain
- Positioning deviation counter value
- Status of CN1 output pin
- Directed current
- Absolute position
- Effective torque

[Display monitored values] dialog box



### 9-1 Displaying monitored values

1. Click the **[Display monitored values]** button on the Main menu. The [Monitor] dialog box appears, enabling you to monitor various signals.
2. The CN1 input /output bit values are as follows.

	CN1 input pin	CN1 output pin
bit7	RESET	ALM8
bit6	ILIM	ALM4
bit5	PROT	ALM2
bit4	NROT	ALM1
bit3	CLE	HBON
bit2	CN1-35	SRDY
bit1	CN1-36	ILIM
bit0	SON	LTG/INP

### Description of other items

**[Main menu]:** Returns to the Main Menu.

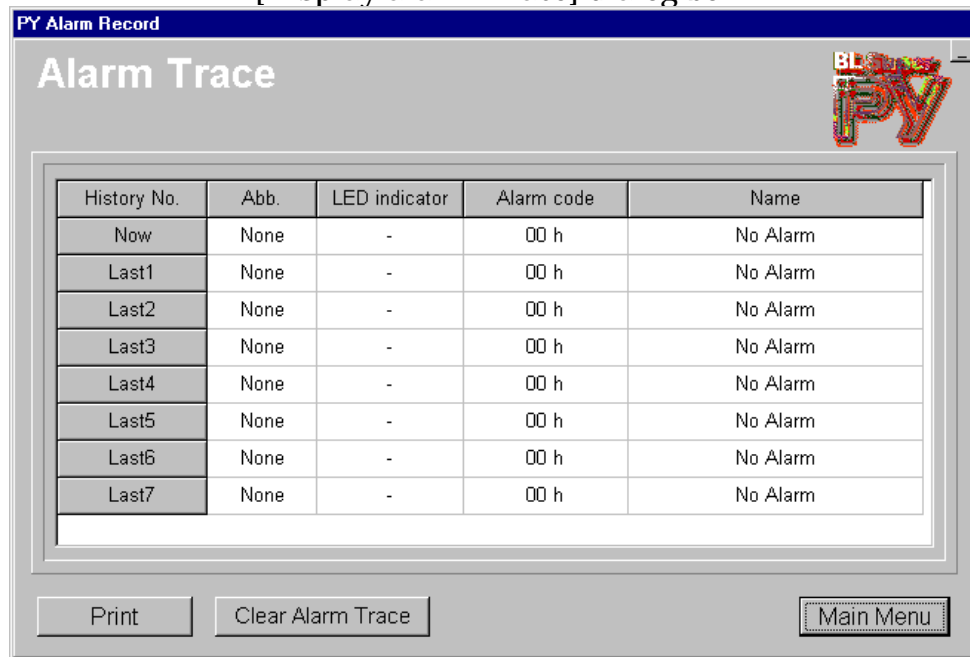
## **Chapter 10 Displaying Alarm History**



## 10 Displaying Alarm History

The **[Display alarm history]** dialog box displays the history of the eight most recent alarms emitted by the servo driver. **[Now]** in the first cell under the title of History Number indicates the current alarm status (if there is no current alarm, "No alarm" appears), **[Last 1] to [Last 7]** record the history of the seven most recent events. History information is updated as necessary.

[Display alarm Trace] dialog box



### 10-1 Displaying Alarm Trace

1. Click the **[Alarm Trace]** button from the Main menu. The [Display alarm Trace] dialog box appears.
2. The alarm history information is updated as necessary.
3. Click the **[Main Menu]** button to return to the Main menu.

#### Description of other items

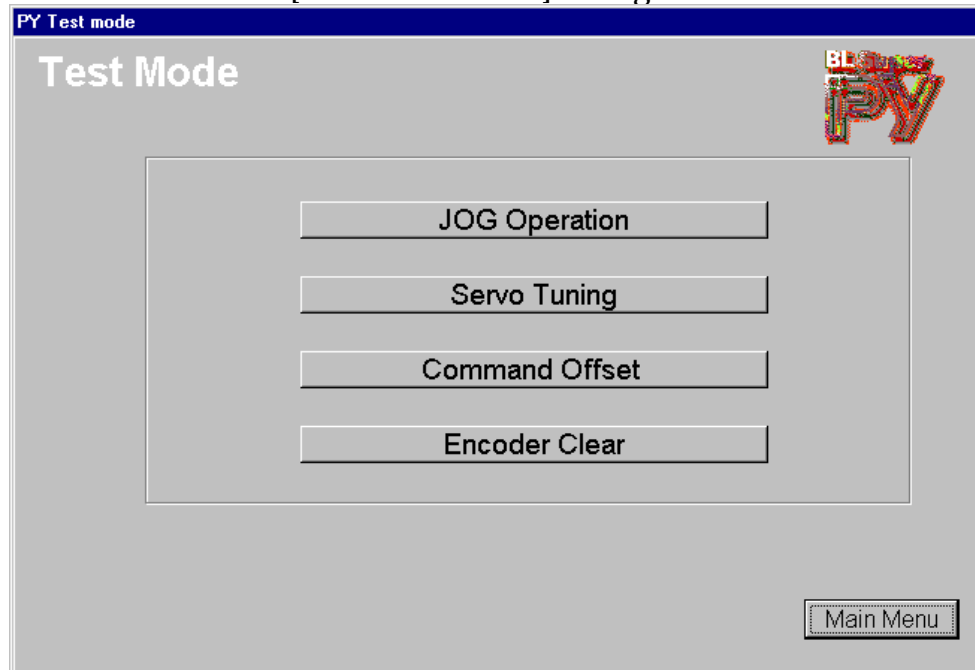
- [Print]:** Prints the current history list.  
**[Clear History]:** Clears the history list.  
**[Main Menu]:** Turns to Main menu.

## **Chapter 11    Test Mode**

## 11 Test mode

In the **[Test mode]** dialog box, the following four different operations are available :

[Select test mode] dialog box



### 11-1 Selecting test mode

1. Click the **[Test mode]** button in the Main menu to open the above dialog box.
2. Click the desired mode to display its associated message on processing.

### Description of other items

**[Main Menu]:** Returns to the Main menu.

### To start jog operation and servo tuning:

- 1) If the control mode type is switching type (velocity <-> torque, position <-> torque, position <-> velocity), turn off the switching input signal.
- 2) Set the command input to 0.
- 3) Turn off the Servo On (SON) signal. In the Test mode, the computer forces the servo driver to start (servo ON) to output the hold-brake excite-timing signal.
- 4) Turn on the main circuit power.
- 5) [Servo ready] is disabled when [JOG] or [Tune] is selected in the Test mode.

### After JOG operation and servo tuning:

- 1) When starting a mode, if you have selected the deviation error alarm for the status after exiting the test mode, you must clear the driver excessive deviation alarm before starting a normal operation. This operation is not recorded in the alarm history.  
For a position control type driver, also perform the deviation clear.
- 2) In case any deviation remains in the user controller, make sure the controller command output is set to 0. **(If the command output is set to a non-zero value, sudden action starts.)**

## 11-2 JOG operation

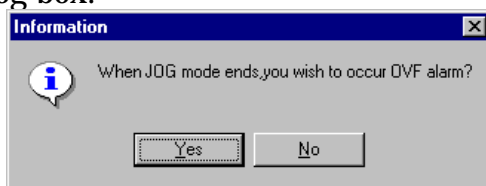
JOG operation allows running the motor in the normal/reverse direction at a specified speed.

Also note the following:

- a. Regardless of the selected control mode, the system operates in the [Velocity control mode] during a JOG operation.
- b. The motor operates in the normal direction (CCW when viewed from the load side) when ☐ is clicked, and in the reverse direction (CW when viewed from the load side) when ☐ is clicked.
- c. Allocate adequate space for the motor operation. Especially for cases with larger load inertia or set speed, take the deceleration time into account for operation.
- d. Since JOG operations are subject to the sequence current limit (Standard value 120%: may be modified in parameter mode 1-12), response may be delayed if the load inertia or load torque is higher.
- e. If the motor must be accelerated or decelerated, set up the associated time with parameter mode 0-10 (for Directed speed, acceleration time) or parameter mode 0-11 (for Directed speed, deceleration time).
- f. Over-travel is also effective during a JOG operation. For example, if an over-travel condition occurs in the normal direction when the motor is operating in the normal direction, the motor stops and rejects any further normal input. Consider the operation time, since the acceleration/deceleration time is also effective under a over-travel condition.
- g. A JOG operation may leave a deviation in the position loop. Be sure to clear any deviation before returning to a normal operation.

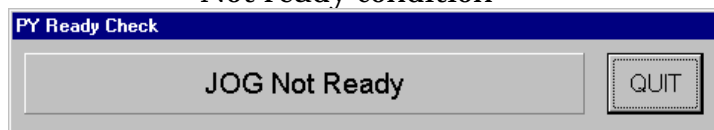
### 11-2-1 Starting JOG operation

1. Click **[JOG operation]** in the [Select test mode] dialog box to display the following [confirmation] dialog box.



The [confirmation] dialog box asks whether you want the servo driver to generate the deviation error alarm after a JOG operation. If you require an alarm to be generated click **[Yes]**, otherwise click **[No]**.

2. If the servo driver is not in the Ready condition, the following dialog box appears.  
Not ready condition

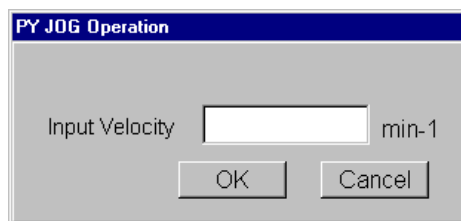


The system is not set up for a JOG operation (the main circuit power is inactive or under an alarm condition, etc.).

If JOG operation becomes available, the [Velocity entry] dialog box appears.

At this time, click **[QUIT]** to return to the [Select test mode] dialog box.

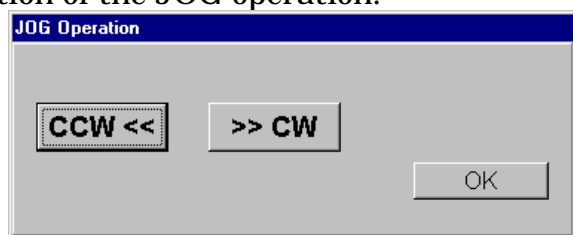
3. If the servo driver is under the Ready status, the JOG Operation's [Velocity entry] dialog box appears.



Type a desired speed in the [Directed speed] field, and click the **[OK]** button to open the [Select direction] dialog box.

Click the **[Cancel]** button to return to the [Select test mode] dialog box.

4. Select the direction of the JOG operation.



The CCW button causes a counterclockwise operation (as viewed from the motor shaft), and the CW button causes a clockwise operation. To start and continue a JOG operation, click and hold the desired direction button until you want to stop the operation.

To return to the [Velocity entry] dialog box, click the **[OK]** button.

**After JOG operation, the deviation of the position loop may remain. Be sure to clear any remaining deviation before returning to a normal operation.**

### 11-3 Servo tuning

With Servo tuning, you can automatically configure appropriate parameters by only issuing the tuning command. When you issue the command, Servo tuning starts the motor and determines the load inertia by monitoring the operation status. This feature sets the four parameters: Position loop gain (Kp), Velocity loop gain (Kvp), Velocity loop integral time-constant (Tvi) and Directed current LPF (ILPF).

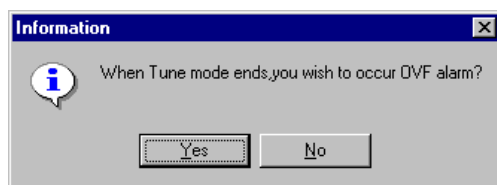
#### 11-3-1 Precautions under operational conditions and load conditions

Before starting the Servo tuning, be sure to adhere to the following:

- 1) If the servo driver starts to vibrate when it is turned on for Servo on, decrease the proportional gain Kvp and increase the integral time-constant Tvi.
- 2) As the Servo tuning starts, the motor is turned in the normal and reverse directions for about 0.5 seconds by the approximate 60 Hz sine-wave-like torque command (equivalent to rated torque at the peak). As the allowable limits for this motor operation, allocate at least one turn either to the normal or reverse direction. Before using Servo tuning, make sure the machine is safe and will not be damaged even if it is vibrated.
- 3) In the following conditions, setting appropriate parameters may be unavailable or tuning errors may be encountered.
  - a. The load inertia is excessively higher than the allowable load inertia.
  - b. Load inertia and/or load torque varies largely.
  - c. Excessive backlash in the ball gears or other gears.
  - d. Mechanical stiffness is weak at a coupling or other connection and mechanical resonance may arise.
  - e. A connection cable was disconnected during Servo tuning.
  - f. The main circuit power supply failed or an alarm occurred during Servo tuning.
  - g. The output current is interrupted by the current limit allowed input.

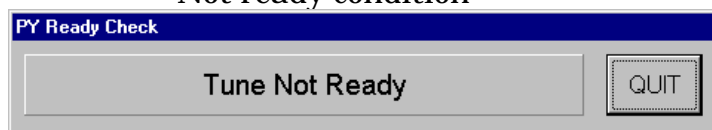
#### 11-3-2 Using servo tuning

1. Click [Servo tuning] in the [Select test mode] to display the [Confirmation] dialog box.



The [Confirmation] dialog box asks whether you want the servo driver to generate the deviation error alarm after a Servo tuning. If you require an alarm to be generated, click **[Yes]**; otherwise click **[No]**.

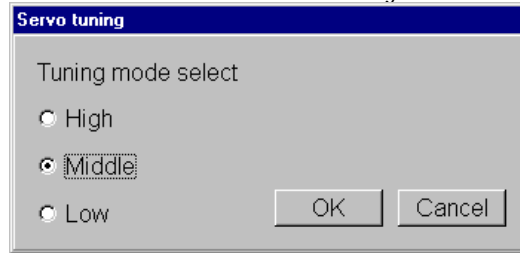
2. If the servo driver is not in the Ready condition, the following dialog box appears.



The system is not set up for a Servo tuning (the main circuit power is inactive or under an alarm condition, etc.).

As the machine becomes available for Servo tuning, the [Select tuning mode] dialog box appears. If you click **[QUIT]**, the [Select test mode] dialog box is returned.

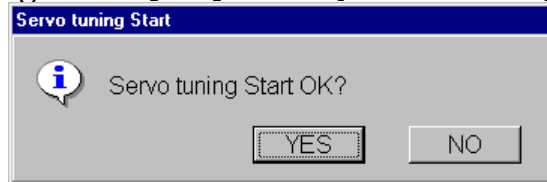
3. Make sure the servo driver is at the Ready condition, and select a tuning mode.



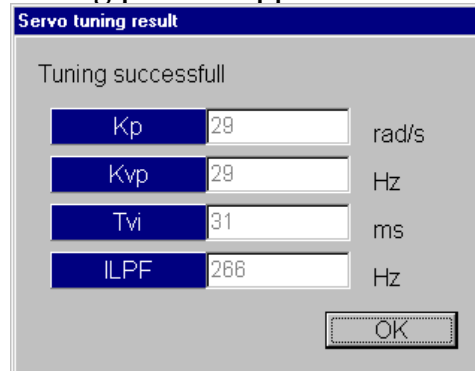
One of the three stiffness levels (Low, Middle and High) can be selected based on the actual mechanical stiffness. After selecting a level, click the **[OK]** button.

To return to the [Select test mode] dialog box, click **[Cancel]**.

4. The [Start tuning confirmation] dialog box opens.  
To start tuning, select **[Yes]** on the [Confirmation] dialog box.



5. Results of the tuning process appear when the process is completed.



The above four parameters are automatically updated after successful tuning. Click the **[OK]** button to return to the [Select tuning mode] dialog box.

**After Servo tuning, the deviation of the position loop may remain. Be sure to clear any remaining deviation before returning to a normal operation.**

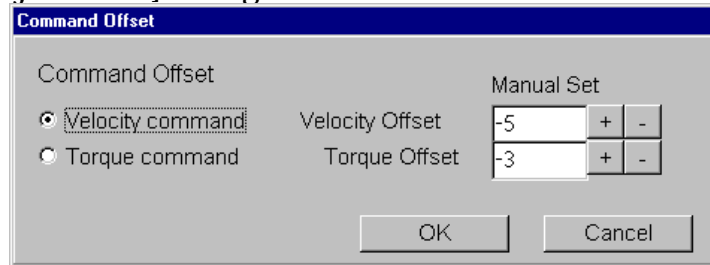
6. To return to the [Select test mode] dialog box, click the **[Cancel]** button.

## 11-4 Adjusting directed offset

Before you can automatically or manually adjust the offset values for the input analog command used in controlling the speed or torque, perform the Adjust directed offset.

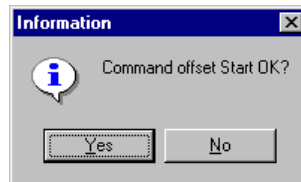
### 11-4-1 Using Adjust directed offset

1. Click **[Adjust directed offset]** in the [Select test mode] dialog box to open the [Auto offset adjustment] dialog box.



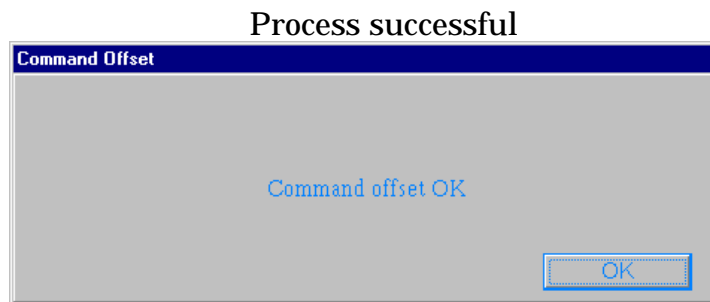
In this dialog box, select the target for the [Auto offset adjustment] dialog box either from the velocity or torque. Click the directed item and then the **[OK]** button.

2. The [Confirmation] dialog box appears. Select **[Yes]** on the [Confirmation] dialog box to start "Auto offset adjustment".



If you select **[No]**, the [Select test mode] dialog box reappears.

3. If the process successfully completed, the following dialog box appears. Click the **[OK]** button.



4. The [Auto offset adjustment] dialog box is returned and the adjusted value appears.
5. To return to the [Select test mode] dialog box, click the **[Cancel]** button.

**NOTE: You can also adjust the offset value by clicking the + or - button. The changed value updates the associated set value in the PY servo driver accordingly.**

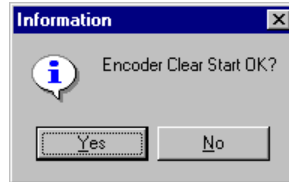


## 11-5 Absolute encoder clear

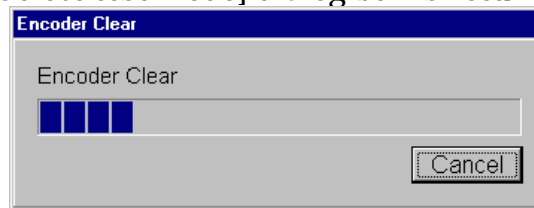
This clears the multi-rotor section data when using the absolute encoder, causing an encoder alarm reset.

### 11-5-1 Using Absolute encoder clear

1. Click [Absolute encoder clear] in the [Select test mode] dialog box to open the [Start confirmation] dialog box.

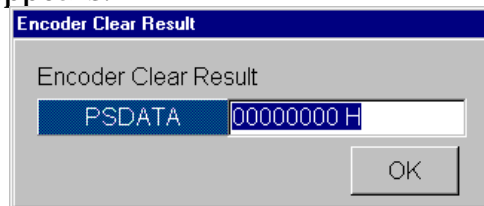


2. Respond **[Yes]** to the confirmation message to start clearing the encoder. If you select **[No]**, the [Select test mode] dialog box is returned.



3. The indicator bar shows the progress of the encoder clearing process. When the clearing process is completed, the result appears. (The process takes about ten seconds.)

If you click the **[Cancel]** button, the clearing process is interrupted and the positioning data appears.



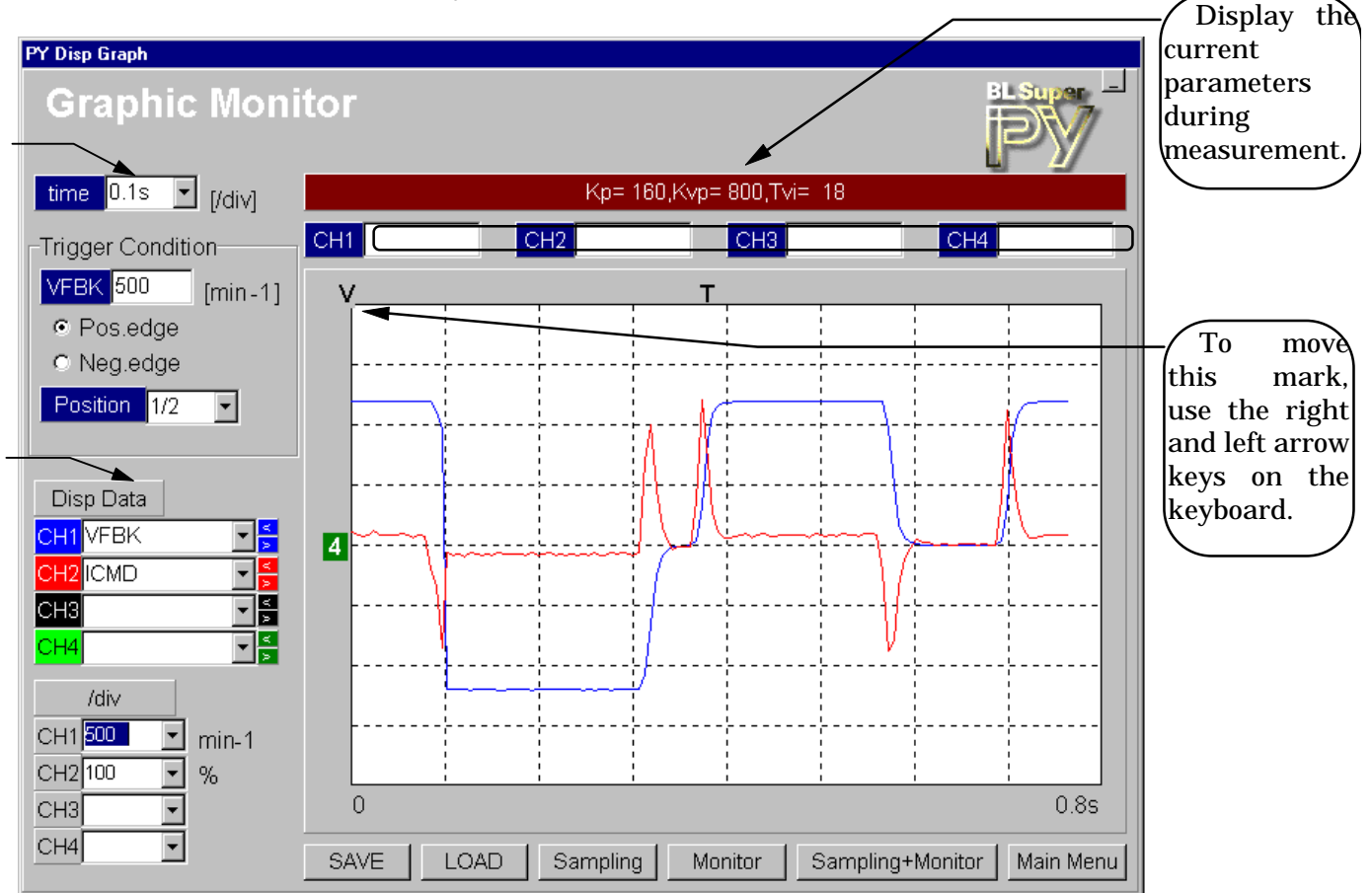
4. To return to the [Select test mode] dialog box, click the **[OK]** button.

**The data is the current data when completing the clear operation. If you want to check the data in real time, use the monitoring dialog box**

## **Chapter 12    Display Graphic Monitor**

## 12 Display Graphic Monitor

The [Display Graphic Monitor] dialog box interprets the operating status of the connected servo driver to display waveforms with different aspects.



### 12-1 Using Graphic Monitor

1. Click **[Graphic Monitor]** in the Main menu to open the Operation Waveform dialog box.
2. Select the time base and displayed data, configure the trigger (trigger signal is fixed to the velocity feedback), and click the **[Sampling + Monitor]** button to enter the wait trigger status.
3. If the process is triggered, the data is loaded and displayed graphically.
4. For this task, you can change the scaling for CH 1 to 4 of the displayed data, display the data indicated by the arrow marking, or save the current screen into a file (\*.csv).  
(The time base cannot be changed after monitoring the waveform.)

#### NOTES:

##### A Time base

- The time base must be set up from the Combo box.
- A whole waveform may not be displayed depending on the selection of a time base, and the triggering position may be deviated accordingly.

##### Description of items

**[Sampling]:** Sends a signal that starts sampling to the servo driver.  
Sampling continues until the servo driver triggers to stop sampling.

**[Monitor]:** Clicking this button starts monitoring of the sampling status of the driver. During sampling (wait for triggering), "On-sampling" appears. When sampling stops, the collected data is loaded and appears on the graphical display.

Clicking the **[Cancel]** button during sampling forcefully terminates sampling. Data up to the time of termination are interpreted and shown on the graphical display.

**[Sampling+Monitor]:** Issues a start sampling signal to the servo driver. Then, this process monitors the sampling status of the driver. If sampling is on the way, "On sampling" appears. When sampling stops, the collected data are loaded and displayed on the panel graphically. Clicking the **[Cancel]** button during sampling forcefully terminates the sampling. Data up to the termination are interpreted and shown on the graphical display.

### 12-1-1 Changing displayed data on CH 1 to 4 ( )

- The offset of the displayed data can be adjusted by clicking the up or down arrow next to the displayed data name for a channel. The ground position appears on the left of the waveform display XY dialog box.
- To hide signals from a channel, clear the signal name by pressing the backspace key after clicking the displayed data name.
- The scaling for the displayed data is available from the Combo box. This setting can be changed after measurement.
- For a waveform on CH 1 to 4, the following items can be selected from the Combo box.

Positioning deviation	ABS.E position (decimal)	Directed Velocity
Velocity feedback	Directed current	Current feedback

The values at V markings on channels CH 1 to 4 can be checked from fields . The V position can be changed pressing the right and left arrow keys.

**NOTE: Four-channel full display is unavailable with "Positioning deviation" or "ABS.E position" selected.**

### 12-2 Loading existing waveform data

Click the **[LOAD]** in the Graphic Monitor dialog box to open the Load parameters from disk dialog box.

For specifying the file to load, refer to Section 3-4, "Loading files". \*.csv is used as the extension.

**NOTE: Never read a file not saved from PC Interface.**

### 12-3 Saving waveform data

This saves the current waveform data and trigger setting on the Graphic Monitor dialog box. Click the **[SAVE]** button to open the **[Save parameters onto disk]** dialog box.

For saving a file, refer to Section 3-5, "Saving files." CSV is used as the extension. Files with a .CSV extension can be loaded into other applications supporting the extension, such as Microsoft Excel, for computing or graphical representation.

## **13 Troubleshooting**

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### **13-1 Unable to install**

- (1) Was a correct folder or file name specified?
- (2) Is the color specification less than 256 colors?

### **13-2 Unable to set up parameters**

- (1) Is the connection to the amplifier established on the Main menu?
- (2) Was a valid range specified?

### **13-3 Unable to print**

- (1) Change the printer resolution to about 300 dpi before printing.

### **13-4 Unable to display waveforms**

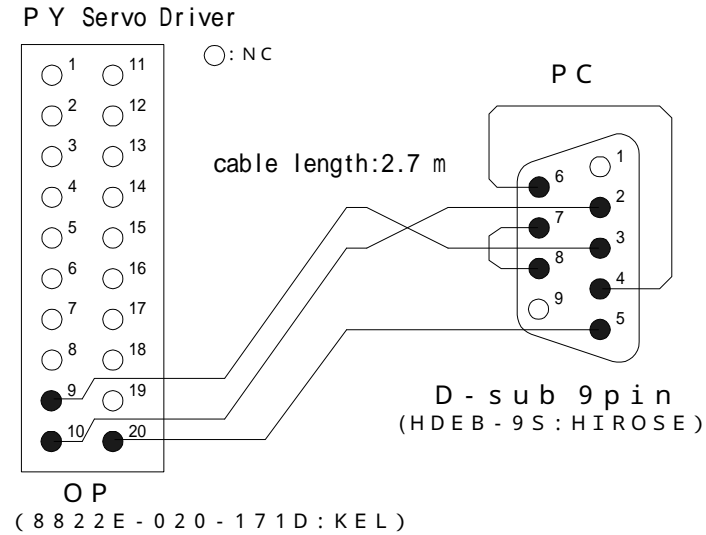
- (1) Was a valid trigger setting configured? (Level, Slope (rising or falling edge, etc.)

### **13-5 Unable to perform Test mode**

- (1) Is the connection to the driver established on Main menu?
- (2) Is the main power turned on?
- (3) Is the system under an alarm condition?

## Appendix A Cable Connection Diagram

The following diagram shows how the provided cable is to be connected:



### Pin number

#### PY servo driver (OP connector)

1	NC	11	NC
2	NC	12	NC
3	NC	13	NC
4	NC	14	NC
5	NC	15	NC
6	NC	16	NC
7	NC	17	NC
8	NC	18	NC
9	RXD	19	GND
10	TXD	20	GND

#### COM

1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

NOTE: Do not connect to NC.

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## NOTICE

1. In the interest of continued product development, Sanyo Denki reserves the right to make improvements in this manual without notice or obligation.
2. The information in this manual has been carefully checked and is believed to be accurate. If you have any question about this manual, do not hesitate to ask us.
3. In no event will Sanyo Denki be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages.

### <Revision History>

Date	Rev. Number	program ver.	information
9/18/98	First edition	1.22E	
5/13/99	Second edition	1.24E	